

Commissioner for Patents  
Page 3

Serial No.: 09/739,902

### AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application:

### LISTING OF CLAIMS

1. (Currently Amended) A method of protecting an Open Shortest Path First (OSPF) network against network failures affecting traffic flow between an interior router (IR) and a predetermined primary area border router (ABR) using a back-up link between the IR and a predetermined alternate ABR, the method comprising steps of:
  - maintaining the back-up link in a dormant state during normal operations of the network, such that no traffic is forwarded to the back-up link during normal operations of the network; and
  - activating the back-up link in response to a network failure affecting communications between the IR and the primary ABR, such that traffic can be routed between the IR and the alternate ABR through the back-up link.
2. (Original) A method as claimed in claim 1, wherein the step of maintaining the back-up link in a dormant state comprises steps of:
  - assigning a backup interface type attribute to the back-up link; and
  - controlling each of the IR and the alternate ABR such that:
    - information respecting the back-up link is not advertised to adjacent routers;
    - and
    - the back-up link is not identified as a valid route in respective forwarding tables of each of the IR and the alternate ABR.
3. (Currently Amended) A method as claimed in claim 1, wherein the step of activating the back-up link comprises steps of:

Commissioner for Patents  
Page 4

Serial No.: 09/739,902

detecting the network failure affecting communications between the IPR and the primary ABR;  
promoting the back-up link to an active status; and  
advertising the back-up link as a valid route.

4. (Original) A method as claimed in claim 3, wherein the network failure is detected by the IR.
5. (Original) A method as claimed in claim 4, wherein the step of promoting the back-up link to an active status is initiated by the IR.
6. (Original) A method as claimed in claim 3, wherein the step of detecting the network failure comprises steps of:  
detecting a loss of communications between the IR and the primary ABR;  
monitoring a link between the IR and the primary ABR for a predetermined period, to detect recovery of communications; and  
declaring a link failure if recovery of communications between the IR and the primary ABR is not detected within the predetermined period.
7. (Original) A method as claimed in claim 3, wherein the step of promoting the back-up link comprises a step of negotiating an adjacency relationship between the IR and the alternate ABR.
8. (Currently Amended) A method as claimed in claim 1, further comprising a step of deactivating the back-up link in response to a network recovery affecting communications between the IPR and the primary ABR, such that traffic flow through the back-up link between the IR and the alternate ABR is terminated.

Commissioner for Patents  
Page 5

Serial No.: 09/739,902

9. (Original) A method as claimed in claim 8, wherein the step of deactivating the back-up link comprises steps of:  
detecting the network recovery; and  
demoting the back-up link to an inactive status.
10. (Original) A method as claimed in claim 9, wherein the network recovery is detected by the IR.
11. (Original) A method as claimed in claim 10, wherein the step of deactivating the back-up link to an inactive status is initiated by the IR.
12. (Original) A method as claimed in claim 9, wherein the step of detecting the network recovery comprises steps of:  
detecting a recovery of communications between the IR and the primary ABR;  
monitoring a link between the IR and the primary ABR for a predetermined period, to detect loss of communications; and  
declaring a link recovery if loss of communications between the IR and the primary ABR is not detected within the predetermined period.
13. (Original) A method as claimed in claim 9, wherein the step of demoting the back-up link comprises a step of terminating an adjacency relationship between the IR and the alternate ABR.
14. (Original) A router adapted for protecting an Open Shortest Path First (OSPF) network against network failures affecting communications with a predetermined adjacent router using a back-up link to a predetermined alternate router, the router comprising:

Commissioner for Patents  
Page 6

Serial No.: 09/739,902

means for maintaining the back-up link in a dormant state during normal operations of the network, such that no traffic is forwarded to the back-up link during normal operations of the network; and

means for activating the back-up link in response to a network failure affecting communications with the primary router, such that traffic can be routed through the back-up link.

15. (Original) A router as claimed in claim 14, wherein the back-up link is provisioned with a back-up interface type attribute.

16. (Original) A router as claimed in claim 15, wherein the means for maintaining the back-up link in a dormant state comprises means responsive to the assigned backup interface type attribute for controlling the router such that:

information respecting the back-up link is not advertised to adjacent routers; and  
the back-up link is not identified as a valid route in a respective forwarding table of the router.

17. (Original) A router as claimed in claim 14, wherein the means for activating the back-up link comprises:

means for detecting the network failure affecting communications with the primary adjacent router;

means for promoting the back-up link to an active status; and

means for advertising the back-up link as a valid route.

18. (Original) A router as claimed in claim 17, wherein the means for detecting the network failure comprises:

means for detecting a loss of communications with the primary adjacent router;

Commissioner for Patents  
Page 7

Serial No.: 09/739,902

means for monitoring a link to the primary adjacent router for a predetermined period, to detect recovery of communications; and

means for declaring a link failure if recovery of communications with the primary adjacent router is not detected within the predetermined period.

19. (Original) A router as claimed in claim 17, wherein the means for promoting the back-up link comprises means for negotiating an adjacency relationship with the alternate router.
20. (Original) A router as claimed in claim 14, further comprising means for deactivating the back-up link in response to a network recovery affecting communications with the primary adjacent router, such that traffic flow with the alternate router through the back-up link is terminated.
21. (Original) A router as claimed in claim 20, wherein the means for deactivating the back-up link comprises:  
  
means for detecting the network recovery; and  
  
means for demoting the back-up link to an inactive status.
22. (Original) A router as claimed in claim 21, wherein the means for detecting the network recovery comprises:  
  
means for detecting a recovery of communications with the primary adjacent router;  
  
means for monitoring a link to the primary adjacent router for a predetermined period, to detect loss of communications; and  
  
means for declaring a link recovery if loss of communications with the primary adjacent router is not detected within the predetermined period.

Commissioner for Patents  
Page 8

Serial No.: 09/739,902

23. (Original) A router as claimed in claim 21, wherein the means for demoting the back-up link comprises means for terminating an adjacency relationship with the alternate adjacent router.
24. (Original) A software program adapted to control a router of an Open Shortest Path First (OSPF) network to protect against network failures affecting communications with a predetermined primary adjacent router using a back-up link to a predetermined alternate router, the software program comprising:  
software adapted to control the router to maintain the back-up link in a dormant state during normal operations of the network, such that no traffic is forwarded to the back-up link during normal operations of the network; and  
software adapted to control the router to activate the back-up link in response to a network failure affecting communications with the primary router, such that traffic can be routed through the back-up link.
25. (Original) A software program as claimed in claim 24, wherein the back-up link is provisioned with a back-up interface type attribute.
26. (Original) A software program as claimed in claim 25, wherein the software adapted to control the router to maintain the back-up link in a dormant state comprises software responsive to the assigned backup interface type attribute for controlling the router such that:  
information respecting the back-up link is not advertised to adjacent routers; and  
the back-up link is not identified as a valid route in a respective forwarding table of the router.
27. (Original) A software program as claimed in claim 24, wherein the software adapted to control the router to activate the back-up link comprises:

Commissioner for Patents  
Page 9

Serial No.: 09/739,902

software adapted to control the router to detect the network failure affecting communications with the primary adjacent router;

software adapted to control the router to promote the back-up link to an active status; and

software adapted to control the router to advertise the back-up link as a valid route.

28. (Original) A software program as claimed in claim 27, wherein the software adapted to control the router to detect the network failure comprises:

software adapted to control the router to detect a loss of communications with the primary adjacent router;

software adapted to control the router to monitor a link to the primary adjacent router for a predetermined period, to detect recovery of communications; and

software adapted to control the router to declare a link failure if recovery of communications with the primary adjacent router is not detected within the predetermined period.

29. (Original) A software program as claimed in claim 27, wherein the software adapted to control the router to promote the back-up link comprises:

software adapted to control the router to negotiate an adjacency relationship with the alternate router; and

software adapted to control the router to update a respective forwarding table of the router to identify the back-up link as a valid route.

30. (Original) A software program as claimed in claim 24, further comprising software adapted to control the router to deactivate the back-up link in response to a network recovery affecting communications with the primary adjacent router,

Commissioner for Patents  
Page 10

Serial No.: 09/739,902

such that traffic flow with the alternate router through the back-up link is terminated.

31. (Original) A software program as claimed in claim 30, wherein the software adapted to control the router to deactivate the back-up link comprises:

software adapted to control the router to detect the network recovery; and

software adapted to control the router to demote the back-up link to an inactive status.

32. (Original) A software program as claimed in claim 31, wherein the software adapted to control the router to detect the network recovery comprises:

software adapted to control the router to detect a recovery of communications with the primary adjacent router;

software adapted to control the router to monitor a link to the primary adjacent router for a predetermined period, to detect loss of communications; and

software adapted to control the router to declare a link recovery if loss of communications with the primary adjacent router is not detected within the predetermined period.

33. (Original) A software program as claimed in claim 31, wherein the software adapted to control the router to demote the back-up link comprises:

software adapted to control the router to terminate an adjacency relationship with the alternate adjacent router; and

software adapted to control the router to update a respective forwarding table of the router to reflect an inactive status the back-up link.